



**SNS COLLEGE OF ENGINEERING**

**(Autonomous)**

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**



**19EC621 – IoT and Wireless Sensor Networks**

**Unit -1 Overview of Internet of Things**

# Web Communication protocols used by connected IoT/M2M devices



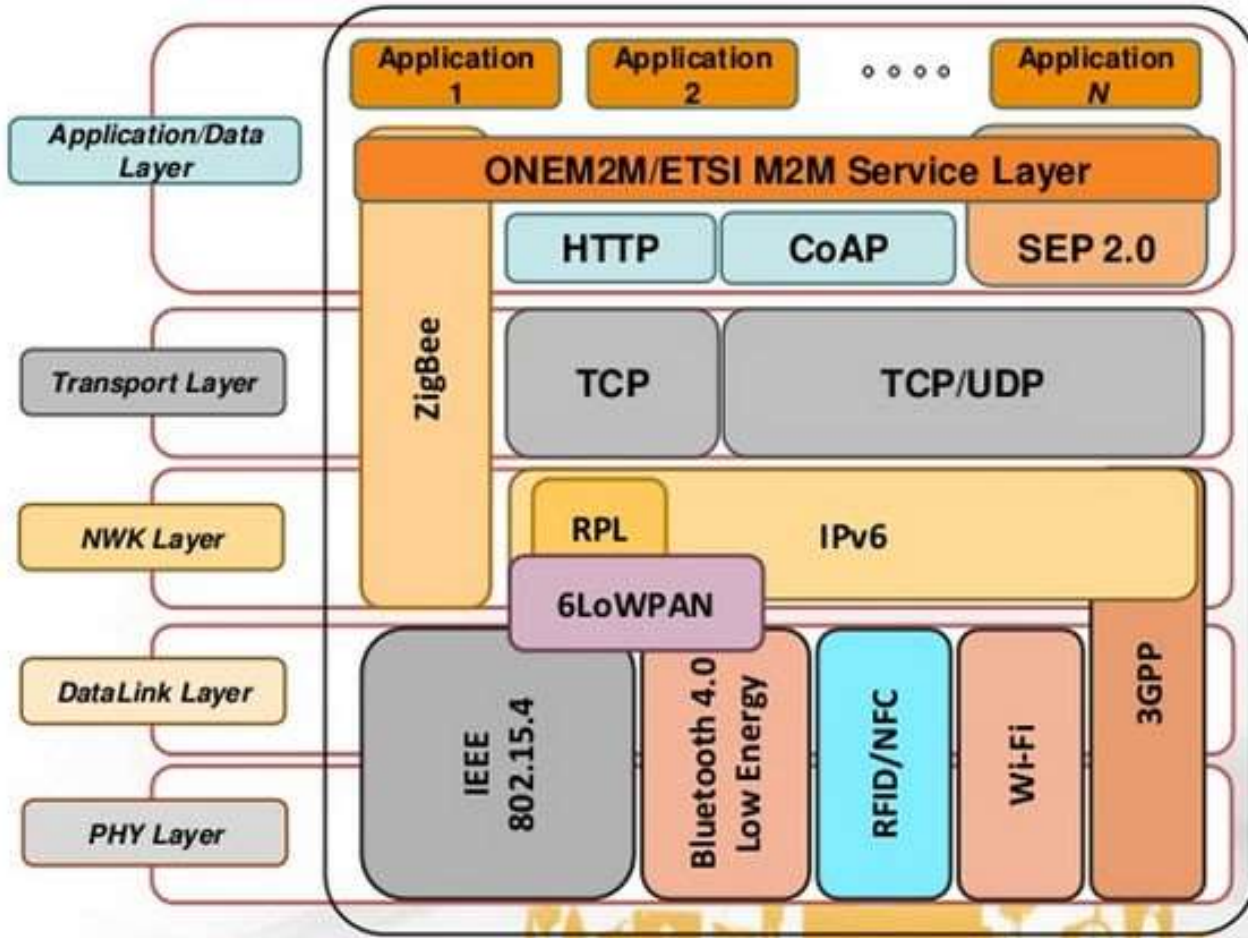


- IPv6
- 6LoWPAN
- RPL
- CoAP
- MQTT
- XMPP



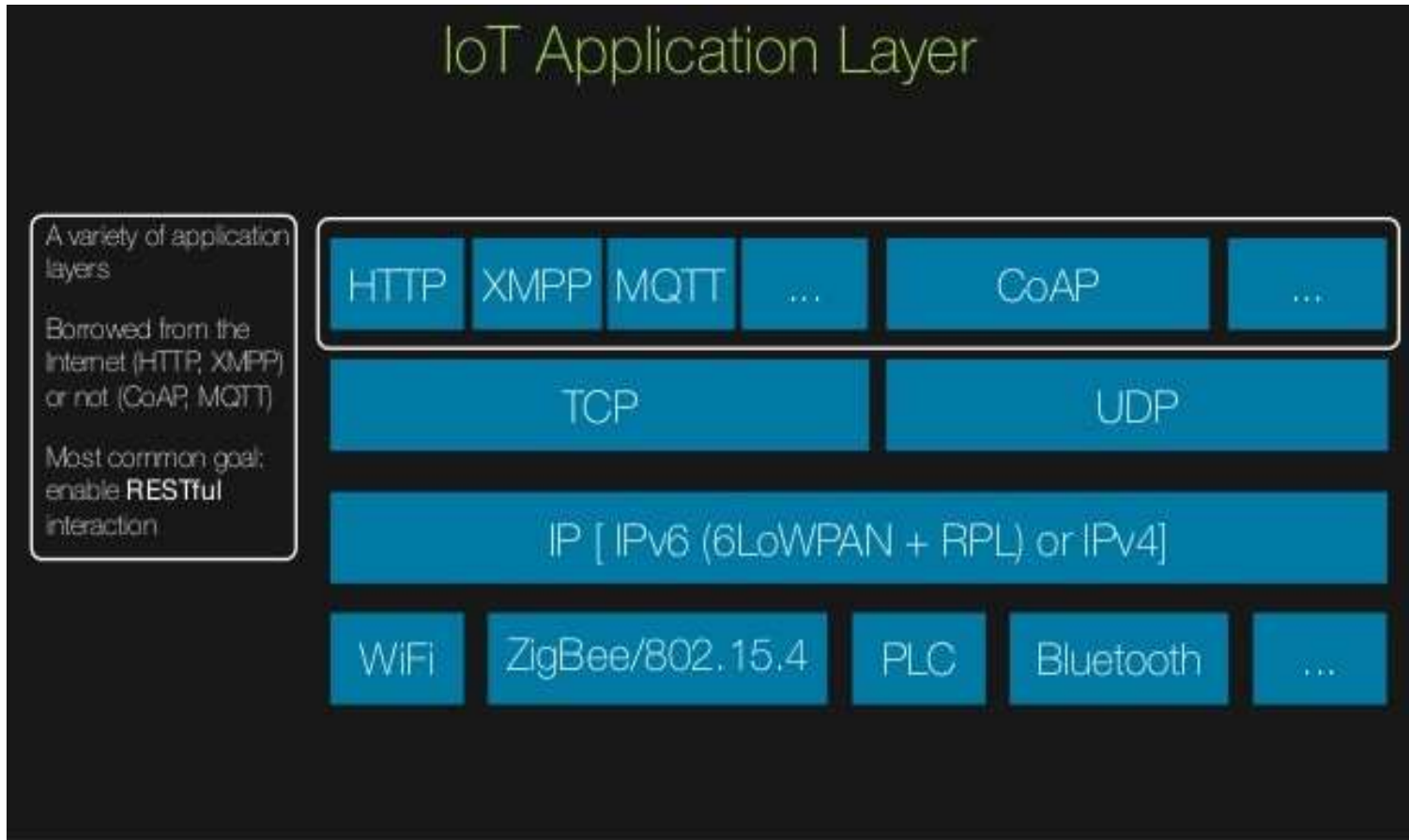


# IoT Protocol Stack



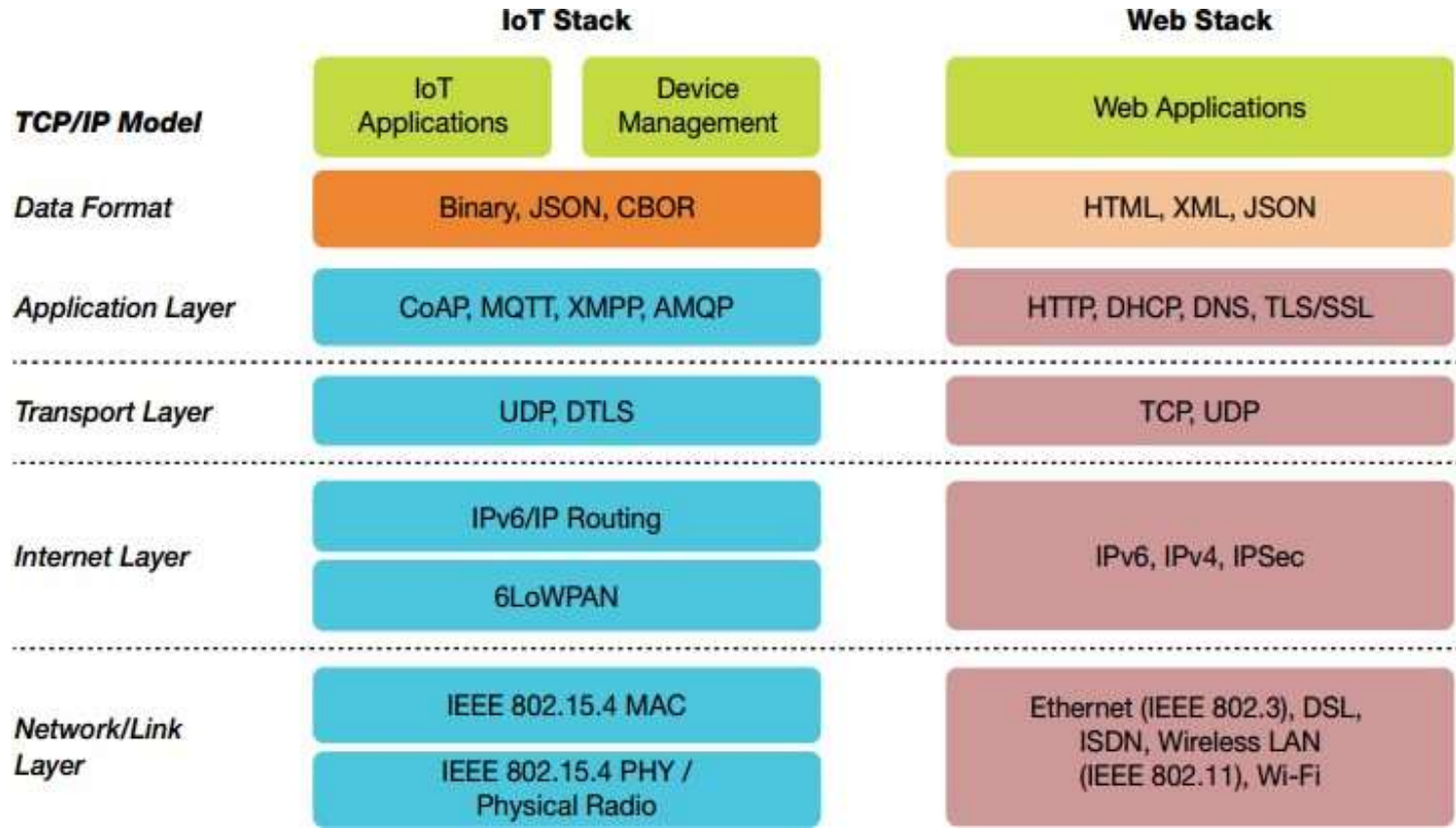


# IoT Protocol Stack





# IoT vs. Internet Protocol Stack

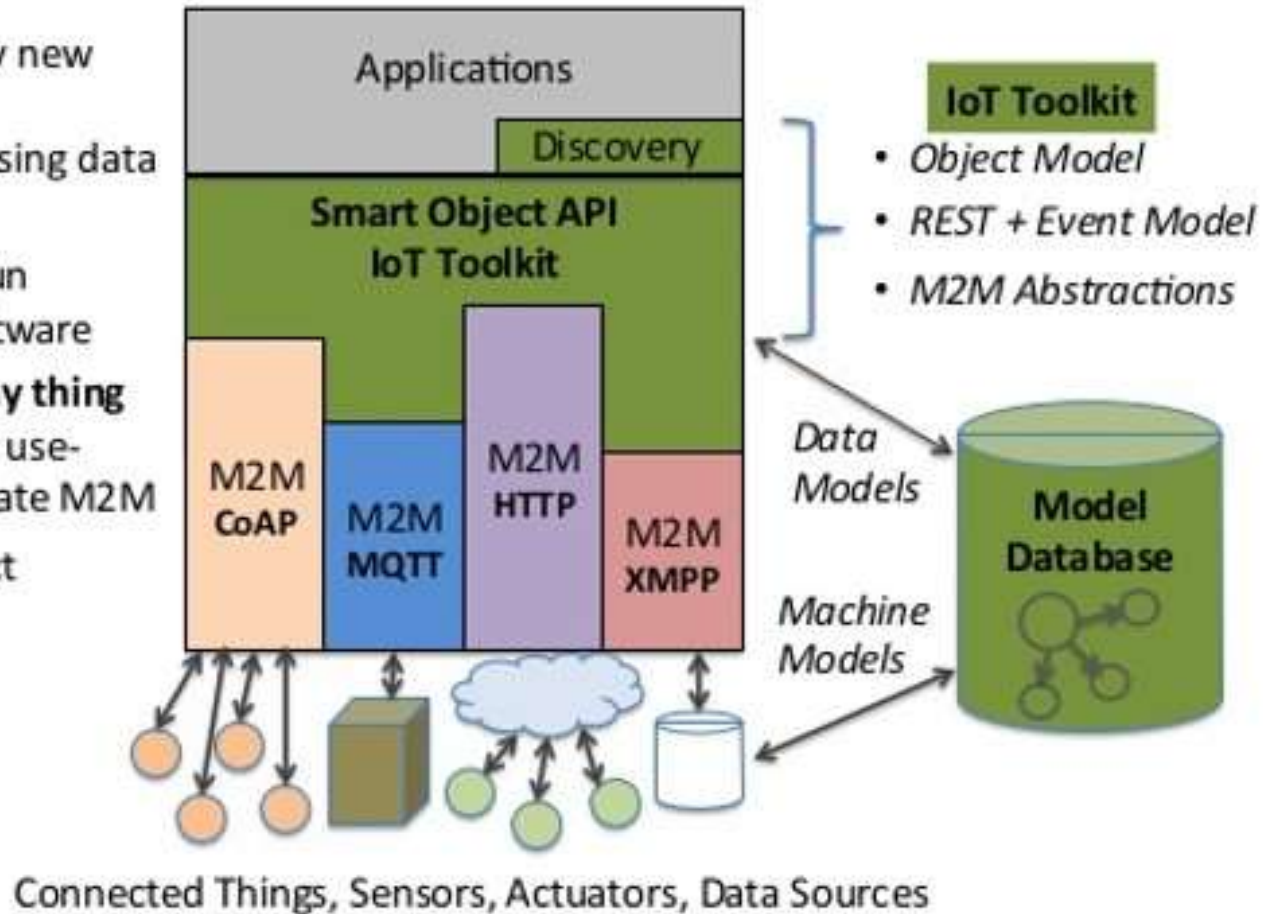




# IoT 2.0 Interoperability



- Easy to deploy new things and applications using data models
- Write once, run anywhere software
- **Any app to any thing** via **any M2M**, use-case appropriate M2M
- Network effect enabled





# IPv6

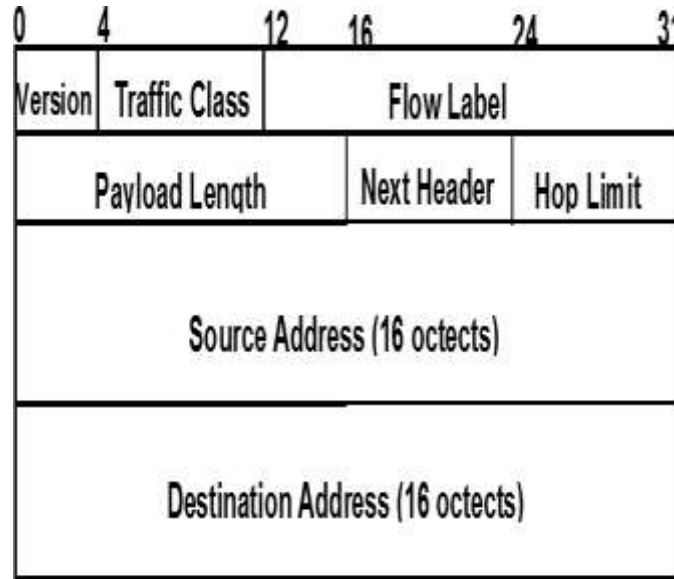


- Problems with IPv4
  - ❑ Shortage of address space
  - ❑ Lack of Quality of Service guarantee
- New features of IPv6
  - ❑ **Enlarge address space**
  - ❑ **Fixed header format** helps speed processing/forwarding
  - ❑ **Better support for Quality of Service**
  - ❑ **Neighbor discovery and Auto-configuration**
  - ❑ Hierarchical address architecture (improved address aggregation)
  - ❑ new “anycast” address: route to “best” of several replicated servers





# IPv6 Header



- Version: 6
- Traffic class:
  - identify class of service
  - E.g., DiffServ (DS codepoint)
    - The 6 most-significant bits are used for DSCP
- Flow Label:
  - identify datagrams in same “flow”
- Next header:
  - identify upper layer protocol for data







# Changes from IPv4 (1/3)



<b>Version</b>	<b>Header Length</b>	<b>Type of Service</b>	<b>Packet Length (bytes)</b>	
<b>Identifier</b>			<b>Flags</b>	<b>13-bit Fragmentation Offset</b>
<b>Time-to-Live</b>	<b>Upper Layer Protocol</b>		<b>Header Checksum</b>	
<b>Source IP Address</b>				
<b>Destination IP Address</b>				
<b>Options</b>				
<b>Data</b>				

<b>Version</b>	<b>Traffic Class</b>	<b>Flow Label</b>		
<b>Payload Length</b>		<b>Next Header</b>	<b>Hop Limit</b>	
<b>Source Address (16 octets)</b>				
<b>Destination Address (16 octets)</b>				





# Changes from IPv4 (2/3)



- Expanded Addressing Capabilities
  - from 32 bits to 128 bits (more level and nodes)
  - improve multicast routing (“scope” field)
  - “anycast address”: send a packet to any one of a group of nodes
- Header Format Simplification
  - reduce bandwidth cost
- Extensions
  - more flexibility





# Changes from IPv4 (3/3)



- Checksum
  - removed to reduce processing at routers
- Fragmentation
  - Not allowed at intermediate routers





Thank  
you

